REMARKS

Claims 1 – 3, 5 – 10, 12 – 18, 20, 22 – 28, 30 – 47 are pending in this application. Claims 4, 11, 19, 21 and 29 have been canceled, without prejudice.

Claims 1 – 16, 18 – 19 and 21 – 39 have been rejected.

Claims 17 and 20 have been allowed.

Amendments to the Claims

Claim 1 has been substantially amended for clarity and structure. The following amendments have been made to claim 1. No new matter has been added.

- Antecedent basis has been corrected for "remaining life" and "voltage." "neurological stimulator" has been replaced with "medical device." Support can be found for this amendment in the specification on page 15, lines 15 – 20.
- "Used capacity of the power source" has been replaced with "capacity information." Support for this amendment can be found in several places in the specification, for example on page 12, line 3.
- The structure of the claim has been improved to eliminate the separate steps of "determining ... where the power source is in its life cycle" and "obtaining a used capacity" with the single step of "determining ... capacity information, which is, in fact, the described operation of the invention. Support for this amendment can be found throughout the specification including, for example, page 7, lines 5 – 11; page 7, line 21 through page 8, line 5; and Figure 4.
- The "determining the remaining life of the power source" step has been clarified to make it clear that the determination is based on both the capacity information and the time that the power source has been

operating. Support for this amendment can be found in the specification, for example from page 13, line 9 through page 14, line 19.

Amendments have been made to independent claim 30 which are similar to the amendments made to claim 1. Similar reasoning and support is provided. No new matter has been added.

Claim 2 has been amended to replace "is done by connecting ..." by "utilizing" for function and clarity. No new matter has been added.

Conforming amendments due to the amendments to claims 1 and 30 have been made to claims 3, 5, 7, 8 – 10, 12 – 17, 20, 22 – 25 and 31 – 34. No new matter has been added.

The dependency of claim 10 has been corrected to claim 9 for proper antecedent basis.

Claims 4, 11, 19, 21 and 29 have been canceled since their subject was largely duplicative.

New claim 40, dependent upon amended claim 1, has been added to include additional language to the method in which the remaining life of the power source is calculated, namely by determining a probable usage rate and determining the remaining life as a function of the capacity information and the time the power source has been operating. Support for this new claim can be found in the specification, for example for page 13, line 9 through page 14, line 19. No new matter has been added.

New claims 41 – 45, all ultimately dependent upon claim 1 through new claim 40, have been added to flush out details on the determination of the remaining life of the power source. Support for this new claim can be found in the specification, for example for page 13, line 9 through page 14, line 19. No new matter has been added.

New claim 46 has been added to recite the substance of the determining step of allowed claim 17 in a claim dependent upon claim 1, through claims 40 and 41. Support for this new claim can be found in the specification and in original claim 17. No new matter has been added.

New claim 47 has been added to recite the substance of the determining step of allowed claim 20 in a claim dependent upon claim 1, through claims 40 and 41. Support for this new claim can be found in the specification and in original claim 20. No new matter has been added.

Rejections Under 35 USC § 102 by Snell

Claims 1 – 16, 19 and 29 – 35 have been rejected under 35 USC § 102 as being anticipated by Snell. These rejections, over the claims as presently amended, are respectfully traversed.

Operation of Snell

Snell discloses a battery monitoring apparatus for a cardiac stimulating device. The basic operation of Snell is illustrated in the flow chart of Figure 2. A user inputs into the apparatus a voltage corresponding to a level at which it is anticipated that the battery should be replaced. (Block 230 and column 8, lines 29 – 35) This user input is not a battery voltage measurement. Rather, it is a target against which a replacement time can be determined. The apparatus then determines the impedance of the battery at replacement time (block 240) by using relationships stored in memory (column 8, lines 36 – 48) and determines the charge depleted at replacement time (block 250). (column 8, lines 48 – 54, and Figure 3) The charge depleted at interrogation is determined (block 270) using the battery impedance previously determined and known relationships stored in memory. (column 8, line 59 – 62) The apparatus then determines (block 280) the charge remaining to replacement and determines (block 290) the time to replacement. (column 8, line 62 through column 9, line 1).

Note that Snell uses battery impedance information in order to determine charge depletion and then uses charge depletion information to ultimately calculate the time remaining to replacement. At no time does Snell actually measure the voltage of the battery.

It is respectfully submitted that the Examiner's assertion that Snell teaches "assessing the power source voltage" is incorrect. The Examiner refers to column 7, lines

29 – 57, for support for the assertion. However, the cited recitation in Snell refers to a prior art monitoring circuit described in U.S. Patent No. 5,507,786 instead of to the invention.

Further, it is respectfully submitted that the Examiner's assertion that Snell teaches "determining, based on the assessed power source voltage, where the power source is in its life cycle" is also incorrect. The Examiner refers to a number of places in the specification for support. However, Snell does not, in fact, utilize the power source voltage to determine where the power source is in its life cycle. As pointed out above, Snell operates by first determining the impedance of the battery and then calculating the time remaining to replacement. Snell utilizes battery impedance and not battery voltage.

Claim 1

As amended, claim 1 clearly is not anticipated by and is patentable over Snell.

Claim 1 recites that the voltage of the power source be assessed through an actual measurement (see claim 1, lines 4 – 5). As discussed above, Snell operates by interrogating battery impedance and not battery voltage. Neither does Snell use battery voltage in any later step in its determination process. Rather Snell relies on battery charge depletion for the determination. In any event, Snell does not, in any way, shape or form, teach assessing the battery voltage based upon an actual measurement. It is respectfully submitted that Snell does not teach, show or suggest this claim limitation.

Claim 1 also recites determining, based on the voltage of the power source, capacity information of the power source (see claim 1, lines 6 – 7). As discussed above, Snell determines capacity information, if at all (actually Snell determines charge depletion), by utilizing battery impedance and not by battery voltage. It is respectfully submitted that Snell does not teach, show or suggest this claim limitation.

Claim 1 also recites determining the remaining life of the power source based on the capacity information and the time that the power source has been operating. Snell completely fails this limitation. Snell simply takes battery impedance information and, through the use of known look-up tables, correlates the battery impedance to a charge

depletion and then to time remaining to replacement. Snell does not include in the determination a time that the apparatus has been operating. By failing to include this factor in the determination, Snell can not take advantage of rate the battery capacity has actually been used in the device. Rather, Snell must make the remaining life determination solely on pre-stored information related only to charge depletion. The present invention, by taking advantage of basing the determining the remaining life step on both the capacity information and the time that the power source has been operating, is able to achieve a more accurate replacement time.

Thus, it can be seen that not only does Snell not anticipate claim 1, Snell operates in a fundamentally different manner and fails to achieve the advantageous results made possible by the recitations of claim 1.

It is respectfully submitted that claim 1 is patentable over Snell and that the rejection of claim 1, as amended, over Snell should be withdrawn.

Claim 2

Claim 2 additionally requires the utilization of an A/D converter to assess the voltage of the power source. Again, the Examiner's reference to column 7, lines 34 – 37, for support refers not to the invention taught by Snell but to the prior art patent. As discussed above, Snell does measure the voltage of the power source at all and, hence, certainly can not use an A/D converter to do so.

It is respectfully submitted that claim 2 is patentable over Snell and that the rejection of claim 2, as amended, over Snell should be withdrawn.

Further, claim 2 is dependent upon claim 1 and should also be allowable for all of the reasons that claim 1 is allowable.

Claim 5

Claim 5 recites additional requirements of the step of determining the remaining life of the power source. The claim requires both determining a probable usage rate of the power source and division of the remaining capacity of the power source by the probable usage rate. This determination of remaining life by taking into account the

actual usage rate of the power source and the remaining power source capacity is clearly lacking in Snell. Snell simply takes battery impedance information and, through the use of known look-up tables, correlates the battery impedance to a charge depletion and then to time remaining to replacement. Snell does not divide the remaining power source capacity by the usage rate of the power source. By failing to include the actual usage in the calculation, Snell can not take advantage of rate the battery capacity has actually been used in the device. Rather, Snell must make the remaining life determination solely on pre-stored information related only to charge depletion. The present invention, by taking advantage of basing the determining the remaining life step on both the capacity information and the time that the power source has been operating, is able to achieve a more accurate replacement time.

Thus, it can be seen that not only does Snell not anticipate claim 5, Snell operates in a fundamentally different manner and fails to achieve the advantageous results made possible by the recitations of claim 5.

It is respectfully submitted that claim 5 is patentable over Snell and that the rejection of claim 5, as amended, over Snell should be withdrawn.

Further, claim 5 is dependent upon claim 1 and should also be allowable for all of the reasons that claim 1 is allowable.

Claim 7

Claim 7 recites the step of determining the probable usage rate of the power source. This requirement is completely missing in Snell. Snell simply takes battery impedance information and, through the use of known look-up tables, correlates the battery impedance to a charge depletion and then to time remaining to replacement. Snell does not divide the remaining power source capacity by the usage rate of the power source. By failing to determine the probable usage rate, Snell can not take advantage of rate the battery capacity has actually been used in the device. Rather, Snell must make the remaining life determination solely on pre-stored information related only to charge depletion. The present invention, by taking advantage of basing the determining the

remaining life step on both the capacity information and the time that the power source has been operating, is able to achieve a more accurate replacement time.

Thus, it can be seen that not only does Snell not anticipate claim 7, Snell operates in a fundamentally different manner and fails to achieve the advantageous results made possible by the recitations of claim 7.

It is respectfully submitted that claim 7 is patentable over Snell and that the rejection of claim 7, as amended, over Snell should be withdrawn.

Further, claim 7 is dependent upon claim 6 and ultimately from claim 1 and should also be allowable for all of the reasons that claim 1 is allowable.

Claim 8

Claim 8 recites additional requirements of the step of determining the probable usage rate of the power source. The claim requires dividing the used capacity of the power source by the length of time that medical device has been working. This calculation of probable usage rate of the power source is clearly lacking in Snell. Snell simply takes battery impedance information and, through the use of known look-up tables, correlates the battery impedance to a charge depletion and then to time remaining to replacement. Snell does not divide the remaining power source capacity by the usage rate of the power source. By failing to calculate the probable usage rate, Snell can not take advantage of rate the battery capacity has actually been used in the device. Rather, Snell must make the remaining life determination solely on pre-stored information related only to charge depletion. The present invention, by taking advantage of basing the determining the remaining life step on both the capacity information and the time that the power source has been operating, is able to achieve a more accurate replacement time.

Thus, it can be seen that not only does Snell not anticipate claim 8, Snell operates in a fundamentally different manner and fails to achieve the advantageous results made possible by the recitations of claim 8.

It is respectfully submitted that claim 8 is patentable over Snell and that the rejection of claim 8, as amended, over Snell should be withdrawn.

Further, claim 8 is dependent upon claim 7 and should also be allowable for all of the reasons that claim 7 is allowable.

Claim 9

Claim 9 recites additional requirements of the step of determining the probable usage rate of the power source. The claim requires determining the used capacity of the power since the last time the medical device was reprogrammed. This concept is clearly lacking in Snell. Snell simply takes battery impedance information and, through the use of known look-up tables, correlates the battery impedance to a charge depletion and then to time remaining to replacement. Snell does not determine the used capacity of the power source since the last reprogramming. By failing to determine the used capacity since last reprogramming, Snell can not take advantage of rate the battery capacity has actually been used in the device since last reprogramming and can not adjust the remaining life of the power source based upon the possibly changed usage rate since last reprogramming. Rather, Snell must make the remaining life determination solely on pre-stored information related only to charge depletion. The present invention, by taking advantage of basing the determining the remaining life step on both the capacity information and the time that the power source has been operating, is able to achieve a more accurate replacement time.

Thus, it can be seen that not only does Snell not anticipate claim 9, Snell operates in a fundamentally different manner and fails to achieve the advantageous results made possible by the recitations of claim 9.

It is respectfully submitted that claim 9 is patentable over Snell and that the rejection of claim 9, as amended, over Snell should be withdrawn.

Further, claim 9 is dependent upon claim 6 and ultimately claim 1 and should also be allowable for all of the reasons that claim 1 is allowable.

Claim 10

Claim 10 recites additional requirements of the step of determining the probable usage rate of the power source. The claim requires the step of dividing the determined

used capacity of the power source since last reprogramming by the length of time since the medical device was reprogrammed. This concept is also clearly lacking in Snell. Snell simply takes battery impedance information and, through the use of known look-up tables, correlates the battery impedance to a charge depletion and then to time remaining to replacement. Snell does not determine the used capacity of the power source since the last reprogramming and, hence, can not divide the used capacity since last reprogramming by the length of time since reprogramming. By failing to determine the used capacity since last reprogramming and make the required division, Snell can not take advantage of rate the battery capacity has actually been used in the device since last reprogramming and can not adjust the remaining life of the power source based upon the possibly changed usage rate since last reprogramming. Rather, Snell must make the remaining life determination solely on pre-stored information related only to charge depletion. The present invention, by taking advantage of basing the determining the remaining life step on both the capacity information and the time that the power source has been operating, is able to achieve a more accurate replacement time.

Thus, it can be seen that not only does Snell not anticipate claim 9, Snell operates in a fundamentally different manner and fails to achieve the advantageous results made possible by the recitations of claim 10.

It is respectfully submitted that claim 10 is patentable over Snell and that the rejection of claim 10, as amended, over Snell should be withdrawn.

Further, claim 10 is dependent upon claim 9 and should also be allowable for all of the reasons that claim 9 is allowable.

Claim 30

As amended, claim 30 clearly is not anticipated by and is patentable over Snell.

Claim 30 recites a voltage determining system for determining the voltage of the power source through an actual measurement (see claim 30, lines 7 – 8). As discussed above, Snell operates by determining battery impedance and not battery voltage. Neither does Snell use battery voltage in any later step in its determination process. Rather Snell

relies on battery charge depletion for the determination. In any event, Snell does not, in any way, shape or form, teach a voltage determination system based upon an actual measurement. It is respectfully submitted that Snell does not teach, show or suggest this claim limitation.

Claim 30 also recites that the processor determines, based on the voltage of the power source, capacity information of the power source (see claim 30, lines 20 – 26). As discussed above, Snell determines capacity information, if at all (actually Snell determines charge depletion), by utilizing battery impedance and not by battery voltage. It is respectfully submitted that Snell does not teach, show or suggest this claim limitation.

Claim 30 also recites that the processor determines the remaining life of the power source based on the capacity information and the time that the power source has been operating (see claim 30, lines 20 – 26). Snell completely fails this limitation. Snell simply takes battery impedance information and, through the use of known look-up tables, correlates the battery impedance to a charge depletion and then to time remaining to replacement. Snell does not include in the determination a time that the apparatus has been operating. By failing to include this factor in the determination, Snell can not take advantage of rate the battery capacity has actually been used in the device. Rather, Snell must make the remaining life determination solely on pre-stored information related only to charge depletion. The present invention, by taking advantage of basing the determining the remaining life step on both the capacity information and the time that the power source has been operating, is able to achieve a more accurate replacement time.

Thus, it can be seen that not only does Snell not anticipate claim 30, Snell operates in a fundamentally different manner and fails to achieve the advantageous results made possible by the recitations of claim 30.

It is respectfully submitted that claim 30 is patentable over Snell and that the rejection of claim 30, as amended, over Snell should be withdrawn.

Claims 3, 6, 12 – 16, 31 – 35

Claims 3, 6, 12 – 16, 31 – 35 are all dependent upon one or more of the claims discussed above. Since claims 3, 6, 12 – 16, 31 – 35 contain all of the limitations of the claims from which they depend, these claims should all be allowable on the basis of the same amendments and the same arguments presented above with respect to the claims from which they depend, including independent claims 1 and 30.

It is respectfully submitted that claims 3, 6, 12 – 16, 31 – 35 are patentable over Snell and that the rejection of claims 3, 6, 12 – 16, 31 – 35 over Snell should be withdrawn.

Rejections Under 35 USC § 103

Claims 18, 21 – 28 and 36 – 39 have been rejected under 35 USC § 103 over Snell in view of differing combinations of other documents including Arai et al, Merritt et al, Canny et al, Kinghorn et al and Barreras. The rejection of claims 18, 22 – 28 and 36 – 39 are respectfully traversed. Claim 21 has been canceled.

Snell has been applied in the same manner as to previously discussed claims from which all of claims 18, 21 – 28 and 36 – 39 depend.

Arai et al has been cited to show calculating the remaining power capacity / power source capacity remaining by using a non-linear formula.

Merritt et al has been cited to show informing the user of where in the power source life the power source is.

Canny et al has been cited to show determining whether the remaining power source capacity falls within a predetermined limit.

Kinghorn et al has been cited to show the power source being a capacitor.

Barreras has been cited to show controlling the pulse width generator within preset limits by patient to adjust stimulation of nervous tissue.

None of the additionally cited documents (Arai et al, Merritt et al, Canny et al, Kinghorn et al and Barreras) affect the arguments presented above with respect to the allowability of the claims from which claims 18, 22 – 28 and 36 – 39 depend.

Claims 18, 22 – 28 and 36 – 39 are all dependent upon one or more claims for which allowability has been argued above, including either of independent claims 1 and 30. Since claims 18, 22 – 28 and 36 – 39 contain all of the limitations of the claims from which they depend, including ultimately claims 1 or 30, claims 18, 22 – 28 and 36 – 39 should be allowable on the basis of the same amendments and the same arguments presented above, including the arguments presented with respect to claims 1 and 30.

It is respectfully submitted that 18, 22 – 28 and 36 – 39 are patentable over Snell in view of any and all of the additionally cited documents and that the rejection of claims 18, 22 – 28 and 36 – 39 over Snell in view of the additionally cited documents should be withdrawn.

New Claims

Claim 40

New claim 40, dependent upon amended claim 1, has been added to include additional language to the method in which the remaining life of the power source is calculated, namely by determining a probable usage rate and determining the remaining life as a function of the capacity information and the time the power source has been operating.

None of the cited documents contain, show or disclose these limitations. For example, Snell simply takes battery impedance information and, through the use of known look-up tables, correlates the battery impedance to a charge depletion and then to time remaining to replacement. Snell does not determine a probable usage rate from capacity information and the time that the power source has been operating and does not determine the remaining life as a function of capacity information and the probable usage rate. By failing to make these determinations, Snell can not take advantage of rate the battery capacity has actually been used in the device. Rather, Snell must make the remaining life determination solely on pre-stored information related only to charge depletion. The present invention, by taking advantage of basing the determining the

remaining life step on both the capacity information and the time that the power source has been operating, is able to achieve a more accurate replacement time.

Thus, it can be seen that Snell operates in a fundamentally different manner and fails to achieve the advantageous results made possible by the recitations of new claim 40.

It is respectfully submitted that claim 40 is patentable over Snell and any and all of the additionally cited documents.

Claims 41 – 45

New claims 41 – 45, all ultimately dependent upon claim 1 through new claim 40, have been added to flush out details on the determination of the remaining life of the power source.

None of the cited documents contain, show or disclose these limitations. For example, Snell simply takes battery impedance information and, through the use of known look-up tables, correlates the battery impedance to a charge depletion and then to time remaining to replacement. Snell does not perform these functions. By failing to perform these functions, Snell can not take advantage of rate the battery capacity has actually been used in the device. Rather, Snell must make the remaining life determination solely on pre-stored information related only to charge depletion. The present invention, by taking advantage of basing the determining the remaining life step on both the capacity information and the time that the power source has been operating, is able to achieve a more accurate replacement time.

Thus, it can be seen that Snell operates in a fundamentally different manner and fails to achieve the advantageous results made possible by the recitations of new claims 41 – 45.

It is respectfully submitted that claims 40 – 45 are patentable over Snell and any and all of the additionally cited documents.

Claim 46

New claim 46, dependent upon amended claim 1, has been added to include additional language to the method in which the remaining life of the power source is calculated, namely by determining a probable usage rate and determining the remaining life as a function of the capacity information and the time the power source has been operating. New claim 46 has been added to recite the substance of the determining step of allowed claim 17 in a claim dependent upon claim 1, through claims 40 and 41.

None of the cited documents contain, show or disclose this limitation. For example, Snell simply takes battery impedance information and, through the use of known look-up tables, correlates the battery impedance to a charge depletion and then to time remaining to replacement. Snell does not determine a probable usage rate from capacity information and the time that the power source has been operating. Snell can not take advantage of rate the battery capacity has actually been used in the device. Rather, Snell must make the remaining life determination solely on pre-stored information related only to charge depletion. The present invention, by taking advantage of basing the determining the remaining life step on both the capacity information and the time that the power source has been operating, is able to achieve a more accurate replacement time.

Thus, it can be seen that Snell operates in a fundamentally different manner and fails to achieve the advantageous results made possible by the recitations of new claim 46.

It is respectfully submitted that claim 46 is patentable over Snell and any and all of the additionally cited documents.

Claim 47

New claim 47, dependent upon amended claim 1, has been added to include additional language to the method in which the remaining life of the power source is calculated, namely by determining a probable usage rate and determining the remaining life as a function of the capacity information and the time the power source has been

operating. New claim 47 has been added to recite the substance of the determining step of allowed claim 20 in a claim dependent upon claim 1, through claims 40 and 41.

None of the cited documents contain, show or disclose this limitation. For example, Snell simply takes battery impedance information and, through the use of known look-up tables, correlates the battery impedance to a charge depletion and then to time remaining to replacement. Snell does not determine a probable usage rate from capacity information and the time that the power source has been operating. Snell can not take advantage of rate the battery capacity has actually been used in the device. Rather, Snell must make the remaining life determination solely on pre-stored information related only to charge depletion. The present invention, by taking advantage of basing the determining the remaining life step on both the capacity information and the time that the power source has been operating, is able to achieve a more accurate replacement time.

Thus, it can be seen that Snell operates in a fundamentally different manner and fails to achieve the advantageous results made possible by the recitations of new claim 47.

It is respectfully submitted that claim 47 is patentable over Snell and any and all of the additionally cited documents.

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Summary

In view of the amendments made and the arguments presented, claims 1 – 3, 5 – 10, 12 – 18, 20, 22 – 28, 30 – 47 should be allowable, this application should be in condition for allowance and a notice to that is earnestly solicited.

Respectfully submitted,

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